



## ENERGY STAR Certification

### *Differences Between Montana's 2008 QAP Criteria and ENERGY STAR*

Language from ENERGY STAR's National Builder Option Package (BOP), which is a prescriptive path to ENERGY STAR qualification for homes three stories or less, can be applied to Montana's QAP to provide threshold and discretionary criteria for energy efficiency. ENERGY STAR provides stricter standards than the 2006 IECC in the area of heating in that the BOP specifies ENERGY STAR labeled 90 AFUE furnaces, 85 AFUE boilers, or 14 SEER/8.5 HSPF heat pumps as minimum efficiency, though it is not suggested that electric heat be used for Climate Zone 6. The IECC uses 80 AFUE as a minimum. ENERGY STAR also requires AC and heat pumps to be sized according to ACCA Manual J and S or ASHRAE Handbooks with a 25% oversizing limit.

Five ENERGY STAR lighting fixtures, fans, or appliances are required per unit as threshold rather than discretionary when using the BOP, while the QAP currently does not include these as threshold or require the ENERGY STAR label. The BOP requires an ENERGY STAR thermostat, minimum water heater efficiency, and a thermal bypass inspection, none of which are currently required in the QAP.

ENERGY STAR's Performance Path requirements include having a certified rater analyze the building post-construction and provide a HERS rating of 80 or less for the Montana Climate Zone for new construction under four stories. The Performance Path also requires ENERGY STAR qualified heating and cooling equipment OR five or more ENERGY STAR qualified lighting fixtures, appliances, ceiling fans with lighting fixtures, and/or ventilation fans OR ENERGY STAR qualified windows. Also, a RESNET certified rater must determine the envelope leakage.

The IECC is stricter than ENERGY STAR in the area of ductwork insulation. The 2006 IECC requires R-8 insulation for ductwork in unconditioned spaces while the BOP requires R-6 and R-4 is recommended in the Performance Path.

For more information about verification options for ENERGY STAR qualified homes:

[http://www.energystar.gov/index.cfm?c=bldrs\\_lenders\\_raters.nh\\_technical\\_resources](http://www.energystar.gov/index.cfm?c=bldrs_lenders_raters.nh_technical_resources)

### **Comparison of ENERGY STAR and MT 2008 QAP Energy Efficiency Requirements**

	ENERGY STAR	MT 2008 QAP
Envelope	2003 IRC	2006 IECC
Attic Insulation	R-49	R-49
Wall Insulation	R-21	R-19
Windows	U-value = 0.35, SHGC = 1.0	U-value = 0.35, SHGC = 1.0
HVAC		
Air Conditioning	13 SEER	13 SEER
Heating	90% AFUE Furnace	80% AFUE Furnace
Thermostats	Digital setback	NA
Lighting	13W CFL/T8 LF	60W Incandescent/ T12 LF
Ceiling Fan	E-Star w/ CFL	Standard w/ Incandescent

## Montana QAP Changes

### *Costs and Benefits*

ENERGY STAR lighting should be a threshold requirement as installing ENERGY STAR qualified compact fluorescent or T8 linear fluorescent lamps with an electronic ballast in place of typical incandescent and T12 linear fluorescent fixtures provides savings to pay for the cost difference in approximately 3.5 years.

To receive points, ceiling fans and exhaust fans should be ENERGY STAR labeled as ceiling fans (lamp savings included) have a simple payback period of less than one year.

Upgrading natural gas furnaces from the existing IECC requirement of 80 AFUE to 93 AFUE provides savings that will pay for the cost difference in approximately 8 years.

An ENERGY STAR labeled thermostat with setback controls typically has a payback of less than one year when setback to 85°F during unoccupied summer hours and 62°F during unoccupied winter hours.

When comparing natural gas tank-type water heaters, a unit with an energy factor of 0.63 compared to 0.59 provides savings for a payback period of 6 years.

ENERGY STAR requires insulation levels based on the 2004 IRC, which uses R-21 insulation in the walls for Montana Climate Zones. The 2006 IECC requires R-19 or 13+5 wall insulation, and based on using R-19 batt insulation in 2x6 walls, adding 1" foam insulation (R-4) provides savings that will pay for the cost of the additional insulation in approximately 30 years.

<b>Energy Star Upgrades</b>	<b>Annual Incremental Savings</b>	<b>Installed Incremental Cost</b>	<b>Payback [years]</b>	<b>Net Lifetime Savings</b>	<b>Product Lifetime [years]</b>
Lighting & Fans					
Ceiling Fan	\$11	\$9	0.8	\$136	10
Apartment Lighting	\$61	\$215	3.5	\$1,215	20
Appliances					
Dishwasher	\$7	\$50	6.9	\$95	13
Refrigerator	\$6	\$50	8.7	\$75	13
HVAC					
Furnace	\$41	\$339	8.2	\$745	18
Programable T-Stat	\$77	\$34	0.4	\$1,151	15
Hot Water					
Upgrade to 0.63 EF	\$17	\$100	6.0	\$168	10
Building Envelope					
Insulation (R-19 to R-23)	\$10	\$285	29.4	\$291	30

Average Utility Rates for MT     \$     0.069   per kWh  
<http://www.eia.doe.gov/>         \$     1.126   per Therm

## Montana QAP Changes

### *Suggested Changes to MT QAP to Increase Support for Greater Energy Efficiency*

Energy	Scoring Items	New	Rehab
*Threshold	Insulation, Windows – Exceeds IECC 2006 standards, Add Air Lock Doors (Single Bldg hi-rise Rehab)		
*Threshold	ENERGY STAR labeled lighting fixtures throughout property		
*Threshold	Furnace/Boiler – ENERGY STAR labeled furnace with a minimum efficiency of 90 AFUE, or boiler with a minimum efficiency of 85 AFUE Electric heating – ENERGY STAR labeled heat pump with a minimum efficiency of 13 SEER and 8.5 HSPF		
*Threshold	Tank-type water heaters with EF $\geq 0.61$ for natural gas and EF $\geq 0.93$ for electric		
*Threshold	ENERGY STAR Appliances (refrigerators, dishwashers, clothes washers)		
8 points	ENERGY STAR Qualification ( <i>for new construction up to three stories</i> ). The building must receive a HERS rating of 80 or less from a RESNET certified rater.		
8 points	Exceed ASHRAE 90.1 Appendix G by 15% <i>for new construction over four stories</i> .		
8 points	<i>For rehab only</i> , have a licensed engineer conduct an energy audit of the property and implement all measures with a payback period less than the expected life of the equipment.		
1 point	Water Flow Saving Devices: Install high efficiency WaterSense toilets that use 1.28 gallons per flush or less and showerheads that use 1.5 gallon per minute (gpm) or less. Faucet aerators should use 1.5 gpm in kitchens and 1.0 gpm in bathrooms.		
½ point	ENERGY STAR labeled Ceiling Fans and Vented Range/Bathroom Fans		
½ point	ENERGY STAR qualified low emissivity Roofing/Metal Roofing		
½ point	Whole Unit Circulating Fan designed to meet ASHRAE 62.2 Ventilation Standards		
½ point	Programmable Thermostats		
½ point	Dimmable Lights or Motion Sensor Light Switches in all Common Areas		
½ point	Hot Water Pipe Insulation: minimum R-2		
½ point	Commissioning Conducted		
½ point	Building Orientation: Minimize Glass on East/West Exposure		
½ point	Window Overhang		
1 point	Hydromatic heating/Ground Source		
1 point	Photovoltaic or solar thermal collector panels		
**Discretionary	Other (List) _____		

\*Threshold points are requirements for new construction and for rehab (when considered cost effective in an audit.)

\*\*Other points will be distributed for energy efficiency measures and renewable energy technologies based on HFA discretion.

Green Building	Scoring Items	New	Rehab
*Threshold	Recycling of (at a minimum) glass, plastic, paper, corrugated cardboard, and aluminum/tin cans in areas where recycling collection service is available		
*Threshold	At least 30% Recycled content Carpet. Carpets, carpet cushion, and adhesives shall be labeled with the Carpet & Rug Institute (CRI) Green Label or Green Label Plus.		
*Threshold	Low VOC paint/adhesive/primer/sealant		
½ point	Engineered Lumber (GluLam, etc.) that contains no urea-formaldehyde		
½ point	Recycled Content Concrete: Greater than 30%		
½ point	Recycled Insulation and Sheetrock: Greater than 30%		
1 point	Water Efficient Landscaping (xeriscaping): Use native plants for at least 50% of the green space to reduce irrigable land onsite		
½ point	Permeable Paving for all parking lots, roadways, and sidewalks		
½ point	Formaldehyde Free/Full Sealed Counter-top		
½ point	Cabinets made from sustainably harvested wood products certified by the Forest Stewardship Council, or made from rapidly renewable materials such as bamboo		
½ point	On-site Recycle of Construction Debris		
1 point	Use of Montana products		
½ point	Prohibit smoking in all units and common areas		
**Discretionary	Other (List) _____		

\*Threshold points are requirements for new construction and for rehab

\*\*Other points will be distributed for green measures based on HFA discretion.